AGUSTIN LUCAS
ELECTRONICS

ASSIGNMENT ON CHAP. 4 TM. 662
REVIEW QUESTIONS ON TRIODES

a. Nichrome, iron, molybdenum and an alloy of nickel and iron.

b. Dr. Lee DeForest.

c. Because the transmitter tubes are designed for more power.

d. Magnesium, barium, zirconium and phosphorous.

e. To absorb any gases emitted from the elements of the tube and get better vacuum.

f. In the triode the plate current can be cut off even with a high positive potential on the plate

g. Yes. a high enough potential can be put on the grid to do so.

h. Because it can control the flow of plate current.

i. The A supply is a high current, low voltage. The B supply is low current high voltage, and the C supply low voltage negligible current.

j. Yes

k. The fixed D.C. operating voltages of the plate, grid and filament.

l. The cathode.

m. To have more effect on the space charge which is allways close to the cathode.

n. The electrostatic field created by a positive potential on the plate acts on such a maner, that the electrones on the space charge are attracted to the plate creating a current flow within the tube.

o. Yes, but the amount is negligible.

p. When the grid is made positive it creates a field which attracts electrones to the plate. When it is made negative the field created repels electrones toward the cathode

q. It is the point when the grid is made so negative that stops the flow of electrones to the plate.

r. Upon the plate voltage and the grid voltage.

s. If the grid is positive, the plate current will increase. also the grid current will increase. a very small increase of the grid positive potential will have the same effect on plate current as increasing the plate voltage up to 50 volts.

t. When the maximum and minimum of both occur at the same instant.

u. No. If the plate would go negative with respect to cathode, the tube would stop conducting

v. Yes. (usually)

w. To prevent the effects of grid current.

x. Bias is a D.C. voltage between the grid and cathode. Grid voltage is the combined fix bias and signal voltage. Cathode voltage would be the reference point voltage.

y. To display graphicaly the behavior of the electron tube.

z. Ebb, the D.C. B supply. ib, instantaneus total plate current. Ib, the total steady plate current. ec, the instamtaneus total grid voltage. Eb, the total plate voltage , average.

aa. In the plate current - grid voltage characteristics, the plate current will be dependent variable and the grid voltage independent. In the plate current - plate voltage characteristics, the plate current is the dependent variable and plate voltage independent.

ab. Static characteristics means no load. Dynamic characteristics with load.

ac. Because secondary emission and the atraction of electrons by the positive potential pn the grid.

ad. Oxide coated emitters have more electrons and the tube doe not reach a saturation point so soon. But the grid voltage nneded for a constant plate current is much higher.

ae. A grid family of curves will give much more imformation than a single curve.

af. The u of a tube is the ratio between a smsll change of plate voltage to a small change in grid voltage which results in the same change in plate current. The Gm is the ratio of the change in plate current to the change in grid voltage which produced it with plate voltage held constant. The rp, is the internal resistance of a tube when varying values of voltages are applied.

ag. Rp is the D.C. plate resistance. The rp, is the A.C. plate resistance.

ah. A tube with a changing u feature.

ai. The rp will decrease with an increase of plate voltage and an increase in the positive potential on the grid and vice - versa.

aj. $u = rp \times Gm$. $rp = \frac{Gm}{u}$. $Gm = u/rp$.

ak. With the load resistor the change is less, because the plate voltage is reduced due to the voltage drop across the load resistor.

al. The dynamic transfer characteristics curve is the curve which correlates the plate current - grid voltage relationship with the load.

am. The load line will have to go on a linear fashion from the given plate current point on the Y axis to the given plate voltage point on the X axis.

an. Non-linear operation causes distortion because, the grid voltage change does not producethe same plate current change on the positive and negative sides of the signal. It can be eliminated by operating on the linear portion,

ao. Ecc, eg and ec. Ecc, Bias voltage. eg, instantaneus value of signal voltage. ec, instantaneus value of voltage between grid and cathode.

ap. When no signal is applied.

aq. Anywhere between 2 to 10 MMFD.

ar. At higher frequency, because at high frequency the capacitive reactance of grid to cathode and plate to cathode became negligible, threfore increasing the feedback.

as. To neutralize the interelectrode capacitance between grid and plate and and stop the oscillations.

CHAPTER 5 TM 662

REVIEW QUESTIONS ON MULTIELECTRODE TUBES

a. Because of the feedback caused by interelectrode capacitance.

b. The triode has three elements, the tetrode has four and the pentode has five or more.

c. To the grid.

d. Single ended tubes have all elements conected to pins on the base. double ended tubes have some element conected to a cap on top.

e. The tetrode has one more circuit. The screen grid and it's voltage supply and some of the interelectrode capacitance is reduced.

f. The triode interelectrode capacitance is about an average of 2 uufd. and in a tetrode it is reduced to about .01 uufd.

g. No. Because the effects of secondary emission.

h. Secondary emission occours when electrones striking the plate remove some of the electrones from the plate material.

i. Because of the secondary emission effects.

j. In the moder tetrode curves, the plate current doesn't drop to cero.

k. In the tetrode the "rp" and "u" are higher. The "Gm" is about the same as in the triode.

l. By placing a negative field between the screen and grid. This field rejects the secondary electrones back to the plate.

m. Physicaly, they are about the same.

o. Yes.

p. In a pentode, the plate current does not decrease with the increase of plate voltage.

q. The advantages are more than the disadvantages; like, no interelectrode capacitance, no secondary emission.

r. The "rp" of a pentode is 200 times that of a triode. The "u" about 100 times and the "Gm" about the same.

s. Because of the high value of "RL" needed.

t. Because of the high "rp" of the pentode.

u..A plate current rise can be obtain with low value of plate voltage.

v. The beam power tube tube is slightly larger because it handles more power than the regular tetrodes and pentodes.

w. By being placed in line with the control grid, it atracts less electrones

x. In the variable "u" pentode the control grid is constructed so the turns of wire are closer at the ends than at the center. The grid the affects the electron flow unevenly. It may cut iff the flow completely at the ends and still let some electrones flow at the center.

y. The structure of the control grid.

z. A multigrid tube contains several grids. A multiunit tube contains more than one set of elements within it's envelope.

CHAPTER 6 TM 662

REVIEW QUESTIONS ON AMPLIFICATION

a. To amplify.

b. In the R.F. range.

c. The positive peaks will be clipped off.

d. Class A operates on the center of the linear portion of the dynamic characteristics line. The plate current flows 360 degrees of the input signal. Class B near or at cut off point. Currentflows 180 degrees. Class AB between class A and B. Current flows more than 180 degrees but less than 360. Class C operates from 1½ to 4 times cut-off. Current flows less than 90 degress.

e. The ratio of A.C. power output that is developed across the load to the D.C. power supplied to the plate.

f. Class A under 20%. Class AB 40%. Class B 40 to 60%. Class C 60 to 80%.

g. A class A amplifier has the least distortion and a class C the most. Class B and AB are in between of A and C.

h. A push-pull amplifier consist of two equal tubes whose grid and plate signal are 180 degrees out of phase; have the same plate supply and same bias supply.

i. A center-tapped secondary transformer and a paraphase amplifier.

j. From the individual characteristics of both tubes. Since both plate currents are 180 degrees out of phase, the characteristics are place 180 degrees out of phasealong the grid voltage line. The resultant characteristic is dynamic characteristic for push-pull.

k. "eg", "ec", "ib" and "eRL" are in phase with each other but 180 degrees out of phase with "eb".

l. Fixed bias is obtained from a separate source. Self bias from the voltage dropped across the cathode resistor. Combination bias from a combination of both.

m. No. Because there is no grid current.

n. Due to a high value of grid resistor, with no signal applied, a space charge forms between grig and cathode, and a minute grid current flows through the grid resistor developing the bias voltage across it.